REVIEW OF DUST-ALLAYING PRACTICES AT WORKING FACES IN SOME BITUMINOUS-COAL AND LIGNITE MINES

BY J. J. FORBES, R. K. FRANKLIN AND S. T. REESE

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INTRODUCTION

It is a recognized fact that in the coal-mining industry coal dust must be allayed to promote the safety and health of underground workers. The Bureau of Mines has been cognizant of the hazards of coal dust for many years, and the necessity of controlling such dust was acknowledged when the Federal Mine Safety Code was formulated. Accumulations of coal dust increase the explosion hazard in a bituminous-coal mine and facilitate the propagation of an explosion. Some of the coal dust produced in mining is inhaled by the workers and contributes to respiratory infection. Impairment of vision and personal discomfort resulting from working in dense clouds of coal dust reflect unfavorably on the efficiency of workmen. Considerable coal dust, originating at the working face, is carried in the ventilating current and deposited elsewhere in the mine, thereby increasing the explosion hazard. It is apparent, therefore, that if coal dust could be allayed effectively at its points of origin, the dust-explosion hazard in bituminous-coal mines would be reduced greatly.

Although dust control is practiced in many bituminous-coal and lignite mines, the extent and effectiveness of control for the entire industry is not generally known. The purpose of this circular is to present such information clearly and to encourage coal-mine operators to install dust-allaying equipment.

Factual data on dust-allaying practices at working faces in a large number of the bituminous-coal and lignite mines in the United States were compiled from reports on recent Federal inspections of these mines. The information is presented in tabular form to permit review of the dust-allaying practices of a substantial part of the industry, by States, and also according to employment, and loading practice.

SUMMARY

This study embraces 1,637 bituminous-coal and lignite mines that employed 290,458 men and produced 1,755,080 tons daily in 23 States.

In 754 mines (46%) in 18 States dust allaying was unnecessary because the mines were wet or the amount of coal dust in suspension was small. Included in this number are all the mines in Maryland, Michigan, Missouri, and North Dakota.

In 520 mines (32%) in 16 States, means were not provided to allay the excessive amount of dust raised in suspension during cutting operations. These include all the mines in Kansas, 82 percent of the mines in Kentucky, and 77 percent of the mines in Virginia.

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In 316 mines (19%) in 17 States, the dust produced during cutting was allayed adequately. Included in this group are all the mines in Utah and 88 percent of the mines in Wyoming. Dust raised in suspension during loading operations at the face was allayed effectively in 114 mines in 13 States.

In 47 mines (3%) in 11 States, allaying of dust was practiced during cutting, but the results were not satisfactory.

All production was loaded by hand in 871 mines (53%). In 355 of these (40%), dust allaying was necessary; however, in 77 percent no provisions were made to allay dust raised in suspension during cutting. Included are all the "hand-loading" mines in Indiana, Iowa, Kansas, New Mexico, and Tennessee, 99 percent of such mines in Kentucky, and 91 percent in Virginia. Dust was adequately allayed in 66 mines (19%), including all the "hand-loading" mines in Utah and 83 percent of such mines in Wyoming.

Mechanical loading was used exclusively in 513 mines (31%). In 363 of these (71%) dust allaying was necessary; however, in 42 percent means were not provided to allay the dust produced during cutting. All mines in which mechanical loading was practiced in Iowa and Montana, 75 percent of such mines in Indiana, 86 percent in Kentucky, and 77 percent in Virginia are included in this group. Dust was allayed adequately in 185 "mechanical-loading" mines (51%), including all such mines in New Mexico and Utah and 71 percent of such mines in Pennsylvania, 67 percent in West Virginia, and 90 percent in Wyoming.

Both hand- and mechanical-loading methods were used in 253 mines (16%). In 165 of these (65%) dust allaying was necessary; however, in 58 percent means were not provided to allay the dust produced during cutting. Included in this group are all the "hand-and-mechanical-loading" mines in Illinois and Indiana and 94 percent of such mines in Kentucky and 91 percent in Virginia. Dust was adequately allayed in 63 combination-loading mines (38%). These include all such mines in Colorado, New Mexico, and Utah, and 77 percent of such mines in Alabama.

Of the 1,637 mines included in the study, 817 (50%) employed 25 to 99 men; 689 (42%) employed 100 to 499 men; 114 (7%) employed 500 to 999 men; and 17 (1%) employed 1,000 or more men.

Of 871 mines in which all production was hand-loaded, 599 (69%) employed 25 to 99 men.

Of the 513 mines in which coal was loaded exclusively by mechanical means, 293 (57%) employed 100 to 499 men.

Of the 253 mines wherein both hand and mechanical loading were practiced, 141 (56%) employed 100 to 499 men.

A summary by States follows:

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Alabama

In more than half the mines in this State (58%), allaying of dust was necessary and in most of these it was done adequately. In 10 mines (14%) the dust produced during cutting was not allayed. Six of these mines employed less than 100 men, and all practiced hand loading. In all of the larger mines (500 or more men), the dust was allayed effectively where necessary.

Arkansas

Dust allaying was necessary in most of the mines in this State (84%), and was practiced in about half of them, but in seven mines (37%) no attempt was made to allay the dust produced during cutting.

Most of these mines employed less than 100 men, and all were hand-loading operations.

Colorado

In most of the mines (70%) in this State, dust allaying was necessary, and in many of them the dust produced during cutting was allayed adequately. However, dust allaying was not practiced where necessary in five mines (15%).

In hand-loading mines (64%), dust was not allayed where necessary in 42% of the mines. In most of the mines where the coal was loaded mechanically and where both hand- and mechanical-loading were employed, the dust produced during cutting was allayed effectively.

Illinois

Dust allaying was necessary in most (78%) of the mines in this State, but the dust produced during cutting was not allayed in 51 mines (43%).

In most of the mines coal was loaded mechanically, and although dust allaying was necessary in almost all of these mines, the dust produced during cutting was allayed adequately in less than half (46%) of them.

Where coal was loaded by hand, dust allaying was not practiced, where necessary, in most (83%) of the mines. The majority employed less than 100 men. In 9 of the 13 larger mines (500 or more men) the dust was allayed adequately, but the methods employed were not effective in the other four mines.

Indiana

In 64 percent of the mines in this State, dust allaying was necessary but was not practiced.

Most of the coal produced was loaded mechanically, and in 12 such mines (75%) the dust produced during cutting was not allayed. Ten of these mines employed 100 to 499 men.

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Iowa

In two of the 10 mines in this State, dust allaying was necessary but was not practiced. Coal was loaded by hand in one of these mines, and coal was loaded mechanically in the other.

Kansas

The study includes only two mines in this State, in both of which dust allaying was necessary but not practiced.

Kentucky

In most (82%) of the mines in this State, dust allaying was necessary but not practiced. In only 15 (6%) was the dust adequately allayed.

Dust produced during cutting was allayed in only two (1%) of the hand-loading mines and in three (6%) of the mines wherein hand and mechanical methods were used. Coal dust was allayed adequately in 10 (14%) of the 70 mines in which coal was loaded by mechanical means exclusively.

In only 4 of the 10 larger mines (500 or more men) was the dust produced during cutting allayed adequately.

Maryland

Dust allaying was unnecessary in the 11 mines in this State included in the study.

Michigan

Dust allaying was unnecessary in the single mine in this State included in the study.

Missouri

In the eight mines in this State, dust allaying was unnecessary.

Montana

Dust allaying was necessary and was practiced in one of the four mines in this State. Production was loaded mechanically in all of these mines.

New Mexico

In one of the four mines included in this study in this State, dust allaying was necessary but was not practiced.

North Dakota

Dust allaying was unnecessary in the two mines included in the study.

Ohio

Although dust-allaying was necessary in 46 percent of the mines in this State, dust was allayed adequately in only 16 mines (20%).

In half of the mines wherein dust-allaying was not practiced, the coal was loaded by hand, and most of these mines employed 25 to 99 men. In all of the larger mines (500 or more men) the dust produced during cutting was allayed adequately.

Oklahoma

Dust allaying was necessary in all of the mines in this State included in the study but was done adequately in only seven (47%). In seven other mines, no means were used to allay dust produced during cutting. Coal was hand-loaded in all Oklahoma mines.

Pennsylvania

In 38 percent of the 293 mines in this State included in the study, dust-allaying was necessary. The dust produced during cutting was allayed adequately in 65 mines (22%), and in 18 (6%) dust-allaying was practiced but was not effective.

Dust-allaying was necessary in 14 percent of the hand-loading mines, but in 42 percent of such mines no means were provided to allay dust. In most of the mechanical-loading mines and combination hand- and mechanical-loading mines the dust produced during cutting was allayed effectively where necessary. In 5 of the 38 larger mines (500 or more men), dust allaying was necessary but was not practiced.

Tennessee

Dust allaying was necessary but was not practiced in most of the mines (60%) in this State. In only one mine was the dust produced during cutting allayed effectively.

Utah

The study included 15 mines in this State. In all of them the dust produced during cutting was allayed adequately.

Virginia

In most of the mines in this State (88%), dust allaying was necessary; however, it was allayed adequately in only six (9%).

In only two of the seven larger mines (500 or more men) was the dust produced during cutting allayed effectively.

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Washington

Dust allaying was necessary in 3 of the 10 mines in this State and was done effectively in 2 of them.

West Virginia

In 30 percent of the 508 mines in this State that were included in the study, dust allaying was necessary. Dust produced during cutting was allayed adequately in 80 mines (16%), and in 9 mines (2%) dust allaying was ineffective.

Dust allaying was necessary in 13 percent of the hand-loading mines but in 61 percent of them no means were provided to allay dust. In less than half (46%) of the mines where coal was loaded mechanically dust allaying was necessary, and it was done effectively in most (67%) of them. Dust allaying was necessary in 37 percent of the combination hand- and mechanical-loading mines, but means of allaying dust were not provided in half of them. In 7 of the 42 larger mines (500 or more men), dust produced during cutting was not allayed.

Wyoming

Dust allaying was practiced effectively in 14 of the 16 mines in this State.

CONCLUSIONS

From the foregoing information it is evident that if the workers in approximately one-third of the bituminous-coal and lignite mines that employ 25 or more men are to be protected against respiratory infection from inhaling coal dust, some means should be provided to allay the dust produced during mining operations at the working face. For the same reason, and in a still greater number of mines, the dust produced during loading and transporting should also be allayed effectively. The allaying of coal dust at these sources in bituminous-coal mines will reduce the dust-explosion hazard, which will be reduced further or eliminated if rock dust is applied liberally and judiciously on dry surfaces.

Although dust produced at faces was allayed effectively in about one-third of the mines requiring dust allaying, no effort was made to control such dust in more than half of these mines. Probably many other mines should be considered as "borderline" cases. Undoubtedly, dust allaying is not practiced in a great number of the mines employing less than 25 men, which are not included in this study. In a relatively small number of mines, efforts to allay dust were ineffective. Generally, dust allaying was practiced to a greater extent in mechanical-loading mines employing 500 or more men than in hand-loading mines with fewer workmen.

Mine workers are becoming increasingly alert to the dust-inhalation hazard in bituminous-coal and lignite mines, and it is quite possible that in the not too distant future legislation will be enacted or working agreements entered into requiring the control of dust where necessary. In some mines such control may be expensive, but it is believed that the cost will be justified by improved health and safety of the employees, greater efficiency in operation, and better industrial relations.

TABLE 1. - Loading practices in bituminous-coal and lignite mines, by States, showing number of mines, employment, and production

	Total			Hand loading					
	Number of mines	Number employed	Tons produced daily	Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent
Alabama......	72	15,306	74,930	41	57	4,508	29	16,465	22
Arkansas.....	19	1,530	4,805	19	100	1,530	100	4,805	100
Colorado.....	33	3,269	17,185	21	64	1,555	47	7,817	45
Illinois.....	120	25,300	212,146	51	43	3,509	14	19,832	10
Indiana......	28	5,769	44,489	8	29	339	6	1,910	4
Iowa.........	10	419	740	9	90	297	71	1,015	58
Kansas.......	2	114	390	2	100	114	100	390	100
Kentucky.....	290	40,331	244,178	159	55	16,498	41	81,351	33
Maryland.....	11	813	4,255	10	91	556	68	2,405	56
Michigan.....	1	32	75	1	100	32	100	75	100
Missouri.....	8	357	931	8	100	357	100	931	100
Montana......	4	593	4,236	-	-	-	-	-	-
New Mexico...	4	813	4,609	1	25	31	4	80	2
North Dakota.	2	198	1,700	1	50	62	31	200	13
Ohio.........	81	12,480	84,234	43	53	2,102	17	10,120	12
Oklahoma.....	15	1,366	5,790	15	100	1,366	100	5,790	100
Pennsylvania.	293	62,580	334,273	173	59	16,669	27	79,372	24
Tennessee....	28	4,358	20,172	19	68	3,168	73	12,222	61
Utah.........	15	3,796	28,347	2	13	97	2	470	2
Virginia.....	67	12,657	66,485	39	58	6,523	51	27,075	41
Washington...	10	890	3,985	9	90	851	96	3,685	92
West Virginia	508	94,972	575,864	234	46	29,379	31	134,771	23
Wyoming......	16	2,515	20,261	6	38	641	25	4,471	22
Total....	1,637	290,458	1,755,080	871	53	90,184	31	415,252	24

	Mechanical loading						Hand and mechanical loading					
	Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent	Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent
Alabama......	15	21	5,975	39	35,180	47	16	22	4,823	32	23,285	31
Arkansas.....	-	-	-	-	-	-	-	-	-	-	-	-
Colorado.....	8	24	836	26	5,908	34	4	12	878	27	3,460	21
Illinois.....	67	56	21,710	86	191,764	90	2	1	81	-	550	-
Indiana......	19	67	5,379	93	42,334	95	1	4	51	1	245	1
Iowa.........	1	10	122	29	725	42	-	-	-	-	-	-
Kansas.......	-	-	-	-	-	-	-	-	-	-	-	-
Kentucky.....	80	28	10,909	27	95,975	40	51	17	12,924	32	66,852	27
Maryland.....	-	-	-	-	-	-	1	9	257	32	1,850	44
Michigan.....	-	-	-	-	-	-	-	-	-	-	-	-
Missouri.....	-	-	-	-	-	-	-	-	-	-	-	-
Montana......	4	100	593	100	4,236	100	-	-	-	-	-	-
New Mexico...	2	50	561	69	2,825	61	1	25	221	27	1,704	37
North Dakota.	1	50	136	69	1,500	87	-	-	-	-	-	-
Ohio.........	35	43	9,807	78	70,464	84	3	4	571	5	3,650	4
Oklahoma.....	-	-	-	-	-	-	-	-	-	-	-	-
Pennsylvania.	65	22	25,862	41	157,752	47	55	19	20,049	32	97,149	29
Tennessee....	4	14	578	13	2,900	14	5	18	612	14	5,050	25
Utah.........	7	47	2,006	53	15,224	54	6	40	1,693	45	12,653	44
Virginia.....	14	21	2,708	22	23,285	35	14	21	3,426	27	16,125	24
Washington...	1	10	39	4	300	8	-	-	-	-	-	-
West Virginia	180	35	39,293	41	314,667	55	94	19	26,300	28	126,426	22
Wyoming......	10	62	1,874	75	15,790	78	-	-	-	-	-	-
Total....	513	31	128,388	44	980,829	56	253	16	71,886	25	358,999	20

TABLE 2. - Loading practices in bituminous-coal and lignite mines, by States, showing number of mines, employment, and production, according to employment groups

State	Number employed	Total						Hand loading					
		Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent	Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent
Alabama	25-99	27	38	1,428	9	5,460	7	25	61	1,282	28	4,760	37
	100-499	36	50	7,664	50	32,120	43	15	37	2,626	58	9,105	57
	500-999	9	12	6,214	41	37,350	50	1	2	600	14	2,600	16
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	72		15,306		74,930		41	57	4,508	29	16,465	22
Arkansas	25-99	13	68	794	58	2,745	57	13	69	794	52	2,745	57
	100-499	6	32	736	42	2,060	43	6	31	736	48	2,060	43
	500-999	-	-	-	-	-	-	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	19		1,530		4,805		19	100	1,530	100	4,805	100
Colorado	25-99	20	61	1,058	32	6,842	40	16	76	836	54	5,042	65
	100-499	12	36	1,573	49	8,193	48	5	24	719	46	2,775	35
	500-999	1	3	638	19	2,150	12	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	33		3,269		17,185		21	64	1,555	47	7,817	45
Illinois	25-99	58	48	2,728	11	18,444	8	42	82	1,940	55	10,762	54
	100-499	49	41	12,962	51	107,405	51	9	18	1,569	45	9,070	46
	500-999	12	10	8,410	33	76,297	36	-	-	-	-	-	-
	1,000 and more	1	1	1,200	5	10,000	5	-	-	-	-	-	-
	Total	120		25,300		212,146		51	43	3,509	14	19,832	10

State	Number employed	Mechanical loading						Hand and mechanical loading					
		Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent	Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent
Alabama	25-99	-	-	-	-	-	-	2	11	146	3	700	3
	100-499	10	67	2,359	40	11,430	32	11	69	2,679	55	11,585	50
	500-999	5	33	3,616	60	23,750	68	3	20	1,998	42	11,000	47
	1,000 or more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	15	21	5,975	39	35,180	47	16	22	4,823	32	23,285	31
Arkansas	25-99	-	-	-	-	-	-	-	-	-	-	-	-
	100-499	-	-	-	-	-	-	-	-	-	-	-	-
	500-999	-	-	-	-	-	-	-	-	-	-	-	-
	1,000 or more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	-	-	-	-	-	-	-	-	-	-	-	-
Colorado	25-99	3	37	192	23	1,400	24	1	25	30	3	400	12
	100-499	5	63	644	77	4,508	76	2	50	210	24	910	26
	500-999	-	-	-	-	-	-	1	25	638	73	2,150	62
	1,000 or more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	8	24	836	26	5,908	34	4	12	878	27	3,460	21
Illinois	25-99	14	21	707	3	7,132	4	2	100	81	100	550	100
	100-499	40	60	11,393	53	98,335	51	-	-	-	-	-	-
	500-999	12	18	8,410	39	76,297	40	-	-	-	-	-	-
	1,000 or more	1	1	1,200	5	10,000	5	-	-	-	-	-	-
	Total	67	56	21,710	86	191,764	90	2	1	81	-	550	-

TABLE 2. - Loading practices in bituminous-coal and lignite mines, by States, showing number of mines, employment, and production, according to employment groups (Cont'd.)

		Total						Hand loading					
State	Number employed	Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent	Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent
Indiana	25-99	10	36	416	7	2,330	5	8	100	339	100	1,910	100
	100-499	17	61	4,836	84	38,659	87	-	-	-	-	-	-
	500-999	1	3	517	9	3,500	8	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	28		5,769		44,489		8	29	339	6	1,910	4
Iowa	25-99	9	90	297	70	1,015	59	9	100	297	100	1,015	100
	100-499	1	10	122	30	725	41	-	-	-	-	-	-
	500-999	-	-	-	-	-	-	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	10		419		1,740		9	90	297	71	1,015	58
Kansas	25-99	2		114	100	390	100	2	100	114	100	390	100
	100-499	-		-	-	-	-	-	-	-	-	-	-
	500-999	-		-	-	-	-	-	-	-	-	-	-
	1,000 and more	-		-	-	-	-	-	-	-	-	-	-
	Total	2		114		390		2	100	114	100	390	100
Kentucky	25-99	157	54	7,743	19	55,620	22	107	67	5,000	30	28,914	36
	100-499	123	42	25,515	63	158,592	65	50	31	10,102	61	47,455	58
	500-999	8	3	3,521	9	16,066	7	2	2	1,396	9	4,982	6
	1,000 and more	2	1	3,552	9	13,900	6	-	-	-	-	-	-
	Total	290		40,331		244,178		159	55	16,498	41	81,351	33

		Mechanical loading						Hand and mechanical loading					
State	Number employed	Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent	Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent
Indiana	25-99	1	5	26	-	175	3	1	100	51	100	245	100
	100-499	17	90	4,836	91	38,659	89	-	-	-	-	-	-
	500-999	1	5	517	9	3,500	8	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	19	67	5,379	93	42,334	95	1	4	51	1	245	1
Iowa	25-99	-	-	-	-	-	-	-	-	-	-	-	-
	100-499	1	100	122	100	725	100	-	-	-	-	-	-
	500-999	-	-	-	-	-	-	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	1	10	122	29	725	42	-	-	-	-	-	-
Kansas	25-99	-	-	-	-	-	-	-	-	-	-	-	-
	100-499	-	-	-	-	-	-	-	-	-	-	-	-
	500-999	-	-	-	-	-	-	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	-	-	-	-	-	-	-	-	-	-	-	-
Kentucky	25-99	37	46	1,950	18	21,115	22	13	25	793	6	5,591	8
	100-499	42	53	8,434	77	70,860	74	31	61	6,979	54	40,277	60
	500-999	1	1	525	5	4,000	6	5	10	1,600	12	7,084	11
	1,000 and more	-	-	-	-	-	-	2	4	3,552	28	13,900	20
	Total	80	28	10,909	27	95,975	40	51	17	12,924	32	66,852	27

TABLE 2. - Loading practices in bituminous-coal and lignite mines, by States, showing number of mines, employment, and production, according to employment groups (Cont'd.)

State	Number employed	Total						Hand loading					
		Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent	Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent
Maryland	25-99	8	73	334	41	1,555		8	80	334	60	1,555	65
	100-499	3	27	479	59	2,700		2	20	222	40	850	35
	500-999	-	-	-	-	-		-	-	-	-	-	-
	1,000 and more	-	-	-	-	-		-	-	-	-	-	-
	Total	11		813		4,255		10	91	556	68	2,405	56
Michigan	25-99	1	100	32	100	75		1	100	32	100	75	100
	100-499	-	-	-	-	-		-	-	-	-	-	-
	500-999	-	-	-	-	-		-	-	-	-	-	-
	1,000 and more	-	-	-	-	-		-	-	-	-	-	-
	Total	1		32		75		1	100	32	100	75	100
Missouri	25-99	8	100	357	100	931		8	100	357	100	931	100
	100-499	-	-	-	-	-		-	-	-	-	-	-
	500-999	-	-	-	-	-		-	-	-	-	-	-
	1,000 and more	-	-	-	-	-		-	-	-	-	-	-
	Total	8		357		931		8	100	357	100	931	100
Montana	25-99	1	25	54	9	550		-	-	-	-	-	-
	100-499	3	75	539	91	3,686		-	-	-	-	-	-
	500-999	-	-	-	-	-		-	-	-	-	-	-
	1,000 and more	-	-	-	-	-		-	-	-	-	-	-
	Total	4		593		4,236		-	-	-	-	-	-

State	Number employed	Mechanical loading						Hand and mechanical loading					
		Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent	Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent
Maryland	25-99	-	-	-	-	-	-	-	-	-	-	-	-
	100-499	-	-	-	-	-	-	1	100	257	100	1,850	100
	500-999	-	-	-	-	-	-	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	-	-	-	-	-	-	1	9	257	32	1,850	44
Michigan	25-99	-	-	-	-	-	-	-	-	-	-	-	-
	100-499	-	-	-	-	-	-	-	-	-	-	-	-
	500-999	-	-	-	-	-	-	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	-	-	-	-	-	-	-	-	-	-	-	-
Missouri	25-99	-	-	-	-	-	-	-	-	-	-	-	-
	100-499	-	-	-	-	-	-	-	-	-	-	-	-
	500-999	-	-	-	-	-	-	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	-	-	-	-	-	-	-	-	-	-	-	-
Montana	25-99	1	25	54	9	550	13	-	-	-	-	-	-
	100-499	3	75	539	91	3,686	87	-	-	-	-	-	-
	500-999	-	-	-	-	-	-	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	4	100	593	100	4,236	100	-	-	-	-	-	-

TABLE 2. - Loading practices in bituminous-coal and lignite mines, by States, showing number of mines, employment, and production, according to employment groups (Cont'd.)

State	Number employed	Total						Hand loading					
		Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent	Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent
New Mexico	25-99	1	25	31	4	80	2	1	100	31	100	80	100
	100-499	3	75	782	96	4,529	98	-	-	-	-	-	-
	500-999	-	-	-	-	-	-	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	4		813		4,609		1	25	31	4	80	2
North Dakota	25-99	1	50	62	31	200	12	1	100	62	100	200	100
	100-499	1	50	136	69	1,500	88	-	-	-	-	-	-
	500-999	-	-	-	-	-	-	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	2		198		1,700		1	50	62	31	200	13
Ohio	25-99	49	60	2,028	16	10,915	13	39	91	1,458	69	7,320	72
	100-499	24	30	5,384	43	34,700	41	4	9	644	31	2,800	28
	500-999	8	10	5,068	41	38,619	46	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	81		12,480		84,234		43	53	2,102	17	10,120	12
Oklahoma	25-99	12	75	774	57	3,090	54	12	75	774	57	3,090	53
	100-499	3	25	592	43	2,700	46	3	25	592	43	2,700	47
	500-999	-	-	-	-	-	-	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	15		1,366		5,790		15	100	1,366	100	5,790	100

State	Number employed	Mechanical loading						Hand and mechanical loading					
		Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent	Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent
New Mexico	25-99	-	-	-	-	-	-	-	-	-	-	-	-
	100-499	2	100	561	100	2,825	100	1	100	221	100	1,704	100
	500-999	-	-	-	-	-	-	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	2	50	561	69	2,825	61	1	25	221	27	1,704	37
North Dakota	25-99	-	-	-	-	-	-	-	-	-	-	-	-
	100-499	1	100	136	100	1,500	100	-	-	-	-	-	-
	500-999	-	-	-	-	-	-	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	1	50	136	69	1,500	87	-	-	-	-	-	-
Ohio	25-99	9	26	485	5	3,245	5	1	33	85	15	350	10
	100-499	18	51	4,254	43	28,600	40	2	67	486	85	3,300	90
	500-999	8	23	5,068	52	38,619	55	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	35	43	9,807	78	70,464	84	3	4	571	5	3,650	4
Oklahoma	25-99	-	-	-	-	-	-	-	-	-	-	-	-
	100-499	-	-	-	-	-	-	-	-	-	-	-	-
	500-999	-	-	-	-	-	-	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 2. - Loading practices in bituminous-coal and lignite mines, by States, showing number of mines, employment, and production, according to employment groups (Cont'd.)

		Total						Hand loading					
State	Number employed	Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent	Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent
Pennsylvania	25-99	166	57	7,722	12	41,114	12	134	78	5,993	36	29,444	37
	100-499	89	30	21,449	34	122,604	37	33	19	6,757	40	30,711	39
	500-999	31	10	22,781	37	116,057	35	6	3	3,919	24	19,217	24
	1,000 and more	7	3	10,628	17	54,498	16	-	-	-	-	-	-
	Total	293		62,580		334,273		173	59	16,669	27	79,372	24
Tennessee	25-99	7	25	311	7	1,715	9	5	26	186	6	665	5
	100-499	21	75	4,047	93	18,457	91	14	74	2,982	94	11,557	95
	500-999	-	-	-	-	-	-	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	28		4,358		20,172		19	68	3,168	73	12,222	61
Utah	25-99	3	20	173	4	920	4	2	100	97	100	470	100
	100-499	10	67	2,216	60	17,127	60	-	-	-	-	-	-
	500-999	2	13	1,407	36	10,300	36	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	15		3,796		28,347		2	13	97	2	470	2
Virginia	25-99	20	30	1,097	9	6,785	10	14	36	723	11	3,785	14
	100-499	40	60	7,378	58	41,725	63	22	56	4,195	64	17,640	65
	500-999	6	9	3,102	25	12,750	19	3	8	1,605	25	5,650	21
	1,000 and more	1	1	1,080	3	5,225	8	-	-	-	-	-	-
	Total	67		12,657		66,485		39	58	6,523	51	27,075	41

		Mechanical loading						Hand and mechanical loading					
State	Number employed	Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent	Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent
Pennsylvania	25-99	15	23	832	3	6,880	4	17	31	897	4	4,790	4
	100-499	34	52	9,731	38	65,071	41	22	40	4,961	25	26,822	28
	500-999	12	19	8,578	33	48,571	31	13	23	10,284	51	48,269	50
	1,000 and more	4	6	6,721	26	37,230	24	3	6	3,907	20	17,268	18
	Total	65	22	25,862	41	157,752	47	55	19	20,049	32	97,149	29
Tennessee	25-99	1	25	48	8	300	10	1	20	77	12	750	15
	100-499	3	75	530	92	2,600	90	4	80	535	88	4,300	85
	500-999	-	-	-	-	-	-	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	4	14	578	13	2,900	14	5	18	612	14	5,050	25
Utah	25-99	-	-	-	-	-	-	1	17	76	4	450	3
	100-499	5	72	599	30	4,924	32	5	83	1,617	96	12,203	97
	500-999	2	28	1,407	70	10,300	68	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	7	47	2,006	53	15,224	54	6	40	1,693	45	12,653	44
Virginia	25-99	2	14	138	5	1,150	5	4	29	236	7	1,850	11
	100-499	11	79	1,920	71	18,385	79	7	50	1,263	37	5,700	36
	500-999	1	7	650	24	3,750	16	2	14	847	25	3,350	21
	1,000 and more	-	-	-	-	-	-	1	7	1,080	31	5,225	32
	Total	14	21	2,708	22	23,285	35	14	21	3,426	27	16,125	24

TABLE 2. - Loading practices in bituminous-coal and lignite mines, by States, showing number of mines, employment, and production, according to employment groups (Cont'd.)

State	Number employed	Total						Hand loading					
		Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent	Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent
Washington	25-99	6	60	254	29	905	23	5	56	215	25	605	16
	100-499	4	40	636	71	3,080	77	4	44	636	75	3,080	84
	500-999	-	-	-	-	-	-	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	10		890		3,985		9	90	851	96	3,685	92
West Virginia	25-99	229	45	11,708	12	81,253	14	143	61	6,908	24	37,385	28
	100-499	237	47	54,551	58	334,743	58	86	37	18,656	63	83,985	62
	500-999	36	7	22,490	24	131,830	23	3	1	2,054	7	9,115	7
	1,000 and more	6	1	6,223	6	28,038	5	2	1	1,761	6	4,286	3
	Total	508		94,972		575,864		234	46	29,379	31	134,771	23
Wyoming	25-99	9	56	637	25	4,475	22	4	67	311	49	1,975	44
	100-499	7	44	1,878	75	15,786	78	2	33	330	51	2,496	56
	500-999	-	-	-	-	-	-	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	16		2,515		20,261		6	38	641	25	4,471	22
Total	25-99	817	50	40,152	14	247,409	14	599	69	28,083	31	143,118	34
	100-499	689	42	153,175	53	951,091	54	255	29	50,766	56	226,284	55
	500-999	114	7	74,448	29	444,919	26	15	2	9,574	11	41,564	10
	1,000 and more	17	1	22,683	3	111,661	6	2	-	1,761	2	4,286	1
		1,637		290,458		1,755,080		871	53	90,184	31	415,252	24

State	Number employed	Mechanical loading						Hand and mechanical loading					
		Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent	Number of mines	Per-cent	Number employed	Per-cent	Tons produced daily	Per-cent
Washington	25-99	1	100	39	100	300	100	-	-	-	-	-	-
	100-499	-	-	-	-	-	-	-	-	-	-	-	-
	500-999	-	-	-	-	-	-	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	1	10	39	4	300	8	-	-	-	-	-	-
West Virginia	25-99	64	36	3,404	9	33,907	11	22	23	1,396	5	9,961	8
	100-499	96	51	22,763	57	183,585	58	55	59	13,132	50	67,173	53
	500-999	19	11	12,053	31	88,451	28	14	15	8,383	32	34,264	27
	1,000 and more	1	-	1,073	3	8,724	3	3	3	3,389	13	15,028	12
	Total	180	35	39,293	41	314,667	55	94	19	26,300	28	126,426	22
Wyoming	25-99	5	50	326	17	2,500	16	-	-	-	-	-	-
	100-499	5	50	1,548	83	13,290	84	-	-	-	-	-	-
	500-999	-	-	-	-	-	-	-	-	-	-	-	-
	1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-
	Total	10	62	1,874	75	15,790	78	-	-	-	-	-	-
Total	25-99	153	30	8,201	6	78,654	8	65	25	3,868	5	25,637	7
	100-499	293	57	70,369	56	548,983	56	141	56	32,340	45	175,824	49
	500-999	61	12	40,824	31	297,238	30	38	15	23,750	33	106,117	30
	1,000 and more	6	1	8,994	7	55,954	6	9	4	11,928	17	51,421	14
		513	31	128,388	44	980,829	56	253	16	71,886	25	358,999	20

TABLE 3. - Extent of dust allaying in bituminous-coal and lignite mines, by States, according to cutting and loading practices

	Total number of mines in study	Number employed	Tons produced daily	Allaying not necessary		Allaying necessary but not practiced		Adequately allayed			
								Cutting		Loading	Other
				No.	Percent	No.	Percent	No.	Percent	No.	No.
Alabama	72	15,306	74,930	30	42	10	14	31	43	18	8
Arkansas	19	1,530	4,805	3	16	7	37	7	37	1	1
Colorado	33	3,629	17,185	10	30	5	15	18	55	17	3
Illinois	120	25,300	212,146	26	22	51	43	32	26	14	8
Indiana	28	5,769	44,489	6	20	18	64	3	12	3	1
Iowa	10	419	1,740	8	80	2	20	-	-	-	-
Kansas	2	114	390	-	-	2	100	-	-	-	-
Kentucky	290	40,331	244,178	36	12	239	82	15	6	10	3
Maryland	11	813	4,255	11	100	-	-	-	-	-	-
Michigan	1	32	75	1	100	-	-	-	-	-	-
Missouri	8	357	931	8	100	-	-	-	-	-	-
Montana	4	593	4,236	3	75	-	-	1	25	-	-
New Mexico	4	813	4,609	-	-	1	25	3	75	2	-
North Dakota	2	198	1,700	2	100	-	-	-	-	-	-
Ohio	81	12,480	84,234	44	54	20	25	16	20	-	-
Oklahoma	15	1,366	5,790	-	-	7	47	7	47	1	5
Pennsylvania	293	62,580	334,273	182	62	28	10	65	22	-	-
Tennessee	28	4,358	20,172	9	32	17	60	1	4	1	-
Utah	15	3,796	28,347	-	-	-	-	15	100	10	4
Virginia	67	12,657	66,485	8	12	52	77	6	9	1	-
Washington	10	890	3,985	7	70	-	-	2	20	-	-
West Virginia	508	94,972	575,864	360	70	59	12	80	16	32	22
Wyoming	16	2,515	20,261	-	-	2	12	14	88	14	-
Total	1,637	290,458	1,755,080	754	46	520	32	316	19	114	55

	Allayed but not adequately				Loading method					
	Cutting		Loading	Other	Hand		Mechanical		Hand and mechanical	
	No.	Percent	No.	No.	No.	Percent	No.	Percent	No.	Percent
Alabama	1	1	1	1	41	57	15	21	16	22
Arkansas	2	10	4	3	19	100	-	-	-	-
Colorado	-	-	-	1	21	64	8	24	4	12
Illinois	11	9	6	3	51	43	67	56	2	1
Indiana	1	4	-	-	8	29	19	67	1	4
Iowa	-	-	-	-	9	90	1	10	-	-
Kansas	-	-	-	-	2	100	-	-	-	-
Kentucky	-	-	-	-	159	55	80	28	51	17
Maryland	-	-	-	-	10	91	-	-	1	9
Michigan	-	-	-	-	1	100	-	-	-	-
Missouri	-	-	-	-	8	100	-	-	-	-
Montana	-	-	-	-	-	-	4	100	-	-
New Mexico	-	-	-	-	1	25	2	50	1	25
North Dakota	-	-	-	-	1	50	1	50	-	-
Ohio	1	1	-	-	43	53	35	43	3	4
Oklahoma	1	6	2	1	15	100	-	-	-	-
Pennsylvania	18	6	-	-	173	59	65	22	55	19
Tennessee	1	4	1	-	19	68	4	14	5	18
Utah	-	-	-	-	2	13	7	47	6	40
Virginia	1	2	-	-	39	58	14	21	14	21
Washington	1	10	-	-	9	90	1	10	-	-
West Virginia	9	2	3	-	234	46	180	35	94	19
Wyoming	-	-	-	-	6	38	10	62	-	-
Total	47	3	17	7	871	53	513	31	253	16

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TABLE 4. - Extent of dust allaying in bituminous-coal and lignite mines, by States, showing cutting and loading practices by employment groups

	Total number of mines in study	Number employed	Tons produced daily	Allaying not necessary		Allaying necessary but not practiced		Adequately allayed			
								Cutting		Loading	Other
				No.	Percent	No.	Percent	No.	Percent	No.	No.
Alabama											
25-99..........	27	1,428	5,460	18	67	6	22	2	7	2	-
100-499........	36	7,664	32,120	12	33	4	11	20	56	17	2
500-999........	9	6,214	37,350	-	-	-	-	9	100	9	6
1,000 and more.	-	-	-	-	-	-	-	-	-	-	-
Total......	72	15,306	74,930	30	42	10	14	31	43	28	8
Arkansas											
25-99..........	13	794	2,745	2	15	5	39	4	31	-	1
100-499........	6	736	2,060	1	17	2	33	3	50	1	-
500-999........	-	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-	-
Total	19	1,530	4,805	3	16	7	37	7	37	1	1
Colorado											
25-99..........	20	1,058	6,842	5	25	4	20	11	55	10	1
100-499........	12	1,573	8,193	5	42	1	8	6	50	6	2
500-999........	1	638	2,150	-	-	-	-	1	-	1	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-	-
Total......	33	3,269	17,185	10	30	5	15	18	55	17	3
Illinois											
25-99..........	58	2,728	18,444	22	38	30	52	3	5	-	-
100-499........	49	12,962	107,405	4	8	21	43	20	41	4	8
500-999........	12	8,410	76,297	-	-	-	-	9	67	-	-
1,000 and more.	1	1,200	10,000	-	-	-	-	-	-	-	-
Total......	120	25,300	212,146	26	22	51	43	32	26	4	8

	Allayed but not adequately				Loading method					
	Cutting		Loading	Other	Hand		Mechanical		Hand and mechanical	
	No.	Percent	No.	No.	No.	Percent	No.	Percent	No.	Percent
Alabama										
25-99..........	1	4	1	-	25	93	-	-	2	7
100-499........	-	-	-	1	15	42	10	28	11	30
500-999........	-	-	-	-	1	11	5	56	3	33
1,000 and more.	-	-	-	-	-	-	-	-	-	-
Total......	1	1	1	1	41	57	15	21	16	22
Arkansas										
25-99..........	2	15	2	2	13	100	-	-	-	-
100-499........	-	-	2	1	6	100	-	-	-	-
500-999........	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-
Total......	2	10	4	3	19	100	-	-	-	-
Colorado										
25-99..........	-	-	-	1	16	80	3	15	1	5
100-499........	-	-	-	-	5	40	5	40	2	20
500-999........	-	-	-	-	-	-	-	-	1	100
1,000 and more.	-	-	-	-	-	-	-	-	-	-
Total......	-	-	-	1	21	64	8	24	4	12
Illinois										
25-99..........	3	5	-	-	42	72	14	24	2	4
100-499........	4	8	2	2	9	18	40	82	-	-
500-999........	3	33	3	1	-	-	12	100	-	-
1,000 and more.	1	100	1	-	-	-	1	100	-	-
Total......	11	9	6	3	51	43	67	56	2	1

TABLE 4. - **Extent of dust allaying in bituminous-coal and lignite mines, by States, showing cutting and loading practices by employment groups (Cont'd.)**

	Total number of mines in study	Number employed	Tons produced daily	Allaying not necessary		Allaying necessary but not practiced		Adequately allayed			
								Cutting		Loading	Other
				No.	Percent	No.	Percent	No.	Percent	No.	No.
Indiana											
25-99..........	10	416	2,330	3	30	7	70	-	-	-	-
100-499........	17	4,836	38,659	3	18	10	58	3	18	3	1
500-999........	1	517	3,500	-	-	1	100	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-	-
Total......	28	5,769	44,489	6	20	18	64	3	12	3	1
Iowa											
25-99..........	9	297	1,015	8	89	1	11	-	-	-	-
100-499........	1	122	725	-	100	1	-	-	-	-	-
500-999........	-	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-	-
Total......	10	419	1,740	8	80	2	20	-	-	-	-
Kansas											
25-99..........	2	114	390	-	-	2	100	-	-	-	-
100-499........	-	-	-	-	-	-	-	-	-	-	-
500-999........	-	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-	-
Total......	2	114	390	-	-	2	100	-	-	-	-
Kentucky											
25-99..........	157	7,743	55,620	30	19	125	80	2	1	-	-
100-499........	123	25,515	158,592	6	5	108	88	9	7	9	1
500-999........	8	3,521	16,066	-	-	5	63	3	37	-	1
1,000 and more.	2	3,552	13,900	-	-	1	-	1	-	1	1
Total	290	40,331	244,178	36	12	239	82	15	6	10	3

	Allayed but not adequately				Loading method					
	Cutting		Loading	Other	Hand		Mechanical		Hand and mechanical	
	No.	Percent	No.	No.	No.	Percent	No.	Percent	No.	Percent
Indiana										
25-99..........	-	-	-	-	8	80	1	10	1	10
100-499........	1	6	-	-	-	-	17	100	-	-
500-999........	-	-	-	-	-	-	1	100	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-
Total......	1	4	-	-	8	29	19	67	1	4
Iowa										
25-99..........	-	-	-	-	9	100	-	-	-	-
100-499........	-	-	-	-	-	-	1	100	-	-
500-999........	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-
Total......	-	-	-	-	9	90	1	10	-	-
Kansas										
25-99..........	-	-	-	-	2	100	-	-	-	-
100-499........	-	-	-	-	-	-	-	-	-	-
500-999........	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-
Total......	-	-	-	-	2	100	-	-	-	-
Kentucky										
25-99..........	-	-	-	-	107	69	37	23	13	8
100-499........	-	-	-	-	50	41	42	34	31	25
500-999........	-	-	-	-	2	25	1	12	5	63
1,000 and more.	-	-	-	-	-	-	-	-	2	100
Total......	-	-	-	-	159	55	80	28	51	17

TABLE 4. - Extent of dust allaying in bituminous-coal and lignite mines, by States, showing cutting and loading practices by employment groups (Cont'd.)

	Total number of mines in study	Number employed	Tons produced daily	Allaying not necessary		Allaying necessary but not practiced		Adequately allayed			
								Cutting		Loading	Other
				No.	Percent	No.	Percent	No.	Percent	No.	No.
Maryland											
25-99..........	8	334	1,555	8	100	-	-	-	-	-	-
100-499........	3	479	2,700	3	100	-	-	-	-	-	-
500-999........	-	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-	-
Total	11	813	4,255	11	100	-	-	-	-	-	-
Michigan											
25-99..........	1	32	75	1	100	-	-	-	-	-	-
100-499........	-	-	-	-	-	-	-	-	-	-	-
500-999........	-	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-	-
Total......	1	32	75	1	100	-	-	-	-	-	-
Missouri											
25-99..........	8	357	931	8	100	-	-	-	-	-	-
100-499........	-	-	-	-	-	-	-	-	-	-	-
500-999........	-	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-	-
Total......	8	357	931	8	100	-	-	-	-	-	-
Montana											
25-99..........	1	54	550	1	100	-	-	-	-	-	-
100-499........	3	539	3,686	2	67	-	-	1	33	1	-
500-999........	-	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-	-
Total......	4	593	4,236	3	75	-	-	1	25	1	-

	Allayed but not adequately				Loading method					
	Cutting		Loading	Other	Hand		Mechanical		Hand and mechanical	
	No.	Percent	No.	No.	No.	Percent	No.	Percent	No.	Percent
Maryland										
25-99..........	-	-	-	-	8	100	-	-	-	-
100-499........	-	-	-	-	2	67	-	-	1	33
500-999........	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-
Total......	-	-	-	-	10	91	-	-	1	9
Michigan										
25-99..........	-	-	-	-	1	100	-	-	-	-
100-499........	-	-	-	-	-	-	-	-	-	-
500-999........	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-
Total......	-	-	-	-	1	100	-	-	-	-
Missouri										
25-99..........	-	-	-	-	8	100	-	-	-	-
100-499........	-	-	-	-	-	-	-	-	-	-
500-999........	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-
Total......	-	-	-	-	8	100	-	-	-	-
Montana										
25-99..........	-	-	-	-	-	-	1	25	-	-
100-499........	-	-	-	-	-	-	3	75	-	-
500-999........	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-
Total......	-	-	-	-	-	-	4	100	-	-

TABLE 4. - **Extent of dust allaying in bituminous-coal and lignite mines, by States, showing cutting and loading practices by employment groups (Cont'd.)**

	Total number of mines in study	Number employed	Tons produced daily	Allaying not necessary		Allaying necessary but not practiced		Adequately allayed			
								Cutting		Loading	Other
				No.	Percent	No.	Percent	No.	Percent	No.	No.
New Mexico											
25-99..........	1	31	80	-	-	1	100	-	-	-	-
100-499........	3	782	4,529	-	-	-	-	3	100	2	-
500-999........	-	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-	-
Total......	4	813	4,609	-	-	1	25	3	75	2	-
North Dakota											
25-99..........	1	62	200	1	-	-	100	-	-	-	-
100-499........	1	136	1,500	1	-	-	100	-	-	-	-
500-999........	-	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-	-
Total......	2	198	1,700	2	-	-	100	-	-	-	-
Ohio											
25-99..........	49	2,028	10,915	36	73	13	27	-	-	-	-
100-499........	24	5,384	34,700	8	33	7	30	8	33	-	-
500-999........	8	5,068	38,619	-	-	-	-	8	100	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-	-
Total......	81	12,480	84,234	44	54	20	25	16	20	-	-
Oklahoma											
25-99..........	12	774	3,090	-	-	6	50	5	42	1	3
100-499........	3	592	2,700	-	-	1	33	2	67	-	2
500-999........	-	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-	-
Total......	15	1,366	5,790	-	-	7	47	7	47	1	5

	Allayed but not adequately				Loading method					
	Cutting		Loading	Other	Hand		Mechanical		Hand and mechanical	
	No.	Percent	No.	No.	No.	Percent	No.	Percent	No.	Percent
New Mexico										
25-99..........	-	-	-	-	1	100	-	-	-	-
100-499........	-	-	-	-	-	-	2	67	1	33
500-999........	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-
Total......	-	-	-	-	1	25	2	50	1	25
North Dakota										
25-99..........	-	-	-	-	1	100	-	-	-	-
100-499........	-	-	-	-	-	-	1	100	-	-
500-999........	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-
Total......	-	-	-	-	1	50	1	50	-	-
Ohio										
25-99..........	-	-	-	-	39	80	9	18	1	2
100-499........	1	4	-	-	4	17	18	75	2	8
500-999........	-	-	-	-	-	-	8	100	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-
Total......	1	1	-	-	43	53	35	43	3	4
Oklahoma										
25-99..........	1	8	2	1	12	80	-	-	-	-
100-499........	-	-	-	-	3	20	-	-	-	-
500-999........	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-
Total......	1	6	2	1	15	100	-	-	-	-

TABLE 4. - Extent of dust allaying in bituminous-coal and lignite mines, by States, showing cutting and loading practices by employment groups (Cont'd.)

	Total number of mines in study	Number employed	Tons produced daily	Allaying not necessary		Allaying necessary but not practiced		Adequately allayed			
								Cutting		Loading	Other
				No.	Percent	No.	Percent	No.	Percent	No.	No.
Pennsylvania											
25-99..........	166	7,722	41,114	148	89	10	6	3	2	-	2
100-499........	89	21,449	122,604	33	37	13	15	33	37	24	16
500-999........	31	22,781	116,057	1	3	5	16	23	74	18	7
1,000 and more.	7	10,628	54,498	-	-	-	-	6	-	4	2
Total......	293	62,580	334,273	182	62	28	10	65	21	46	27
Tennessee											
25-99..........	7	311	1,715	6	86	1	14	-	-	-	-
100-499........	21	4,047	18,457	3	14	16	76	1	5	1	-
500-999........	-	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-	-
Total......	28	4,358	20,172	9	32	17	60	-	4	1	-
Utah											
25-99..........	3	173	920	-	-	-	-	3	100	3	-
100-499........	10	2,216	17,127	-	-	-	-	10	100	5	3
500-999........	2	1,407	10,300	-	-	-	-	2	100	2	1
1,000 and more.	-	-	-	-	-	-	-	-	-	-	-
Total......	15	3,796	28,347	-	-	-	-	15	100	10	4
Virginia											
25-99..........	20	1,097	6,785	3	15	17	85	-	-	-	-
100-499........	40	7,378	41,725	5	12	31	78	4	10	1	-
500-999........	6	3,102	12,750	-	-	3	50	2	33	-	-
1,000 and more.	1	1,080	5,225	-	-	1	100	-	-	-	-
Total......	67	12,657	66,485	8	12	52	77	6	9	1	-

	Allayed but not adequately				Loading method					
	Cutting		Loading	Other	Hand		Mechanical		Hand and mechanical	
	No.	Percent	No.	No.	No.	Percent	No.	Percent	No.	Percent
Pennsylvania										
25-99..........	5	3	1	-	134	81	15	9	17	10
100-499........	10	11	2	-	33	37	34	38	22	25
500-999........	2	7	1	1	6	19	12	39	13	42
1,000 and more.	1	-	4	-	-	-	4	57	3	43
Total......	18	7	8	1	173	59	65	22	55	19
Tennessee										
25-99..........	-	-	-	-	5	72	1	14	1	14
100-499........	1	5	1	-	14	67	3	14	4	19
500-999........	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-
Total......	1	4	1	-	19	68	4	14	5	18
Utah										
25-99..........	-	-	-	-	2	67	-	-	1	33
100-499........	-	-	-	-	-	-	5	50	5	50
500-999........	-	-	-	-	-	-	2	100	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-
Total......	-	-	-	-	2	13	7	47	6	40
Virginia										
25-99..........	-	-	-	-	14	70	2	10	4	20
100-499........	-	-	-	-	22	55	11	27	7	18
500-999........	1	17	-	-	3	50	1	16	2	34
1,000 and more.	-	-	-	-	-	-	-	-	1	-
Total......	1	2	-	-	39	58	14	21	14	21

TABLE 4. - Extent of dust allaying in bituminous-coal and lignite mines, by States, showing cutting and loading practices by employment groups (Cont'd.)

	Total number of mines in study	Number employed	Tons produced daily	Allaying not necessary		Allaying necessary but not practiced		Adequately allayed			
								Cutting		Loading	Other
				No.	Percent	No.	Percent	No.	Percent	No.	No.
Washington											
25-99..........	6	254	905	6	100	-	-	-	-	-	-
100-499........	4	636	3,080	1	25	-	-	2	50	-	-
500-999........	-	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-	-
Total......	10	890	3,985	7	70	-	-	2	20	-	-
West Virginia											
25-99..........	229	11,708	81,253	189	82	24	10	13	6	-	2
100-499........	237	54,551	334,743	158	66	28	12	46	20	19	12
500-999........	36	22,490	131,830	9	25	6	17	20	56	13	8
1,000 and more.	6	6,223	28,038	4	67	1	17	1	16	-	-
Total......	508	94,972	575,864	360	70	59	12	80	16	32	22
Wyoming											
25-99..........	9	637	4,475	-	-	2	22	7	78	7	-
100-499........	7	1,878	15,786	-	-	-	-	7	100	7	-
500-999........	-	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-	-
Total......	16	2,515	20,261	-	-	2	12	14	88	14	-
Total											
25-99..........	817	40,152	246,409	495	60	254	31	53	7	23	9
100-499........	689	153,475	951,091	245	36	243	36	178	25	100	47
500-999........	114	74,148	444,919	10	9	20	18	77	67	43	23
1,000 and more.	17	22,683	111,661	4	24	3	18	8	46	5	3
Total......	1,637	290,458	1,754,080	754	46	520	32	316	19	171	82

	Allayed but not adequately				Loading method					
	Cutting		Loading	Other	Hand		Mechanical		Hand and mechanical	
	No.	Percent	No.	No.	No.	Percent	No.	Percent	No.	Percent
Washington										
25-99..........	-	-	-	-	5	83	1	17	-	-
100-499........	1	25	-	-	4	100	-	-	-	-
500-999........	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-
Total......	1	10	-	-	9	90	1	10	-	-
West Virginia										
25-99..........	3	2	-	-	143	63	64	28	22	9
100-499........	5	2	3	-	86	36	96	41	55	23
500-999........	1	2	-	-	3	8	19	53	14	39
1,000 and more.	-	-	-	-	2	34	1	16	3	50
Total......	9	2	3	-	234	46	180	35	94	19
Wyoming										
25-99..........	-	-	-	-	4	44	5	56	-	-
100-499........	-	-	-	-	2	28	5	72	-	-
500-999........	-	-	-	-	-	-	-	-	-	-
1,000 and more.	-	-	-	-	-	-	-	-	-	-
Total......	-	-	-	-	6	38	10	62	-	-
Total										
25-99..........	15	2	6	4	599	73	153	19	65	8
100-499........	23	3	10	4	255	37	293	43	141	20
500-999........	7	6	4	2	15	13	61	54	38	33
1,000 and more.	2	12	5	-	2	12	6	35	9	53
Total......	47	3	25	10	871	53	513	31	253	16

TABLE 5. - Dust-allaying practices in bituminous-coal and lignite mines during cutting, according to loading methods, by States

	Total number of mines	Hand loading												Mechanical loading												Hand and mechanical loading											
		Allaying unnecessary		Allaying necessary										Allaying unnecessary		Allaying necessary										Allaying unnecessary		Allaying necessary									
						Not allayed		Adequately allayed		Allaying inadequate								Not allayed		Adequately allayed		Allaying inadequate						Not allayed		Adequately allayed		Allaying inadequate	
		No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent
Alabama.......	72	25	61	16	39	6	38	9	56	1	6	2	13	13	87	1	8	12	92	-	-	3	19	13	81	3	23	10	77	-	-
Arkansas......	19	3	16	16	84	7	43	7	43	2	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colorado......	33	9	43	12	57	5	42	7	58	-	-	-	-	8	100	1	12	7	88	-	-	1	25	3	75	-	-	3	100	-	-
Illinois......	120	22	43	29	57	24	83	3	10	2	7	4	6	63	94	25	40	29	46	9	14	-	-	2	100	2	100	-	-	-	-
Indiana.......	28	3	38	5	62	5	100	-	-	-	-	3	16	16	84	12	75	3	19	1	6	-	-	1	100	1	100	-	-	-	-
Iowa..........	10	8	89	1	11	1	100	-	-	-	-	-	-	1	100	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kansas........	2	-	-	2	100	2	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kentucky......	290	26	16	133	84	131	99	2	1	-	-	10	12	70	88	60	86	10	14	-	-	-	-	51	100	48	94	3	6	-	-
Maryland......	11	10	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	100	-	-	-	-	-	-	-	-
Michigan......	1	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Missouri......	8	8	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montana.......	4	-	-	-	-	-	-	-	-	-	-	3	75	1	25	-	-	1	100	-	-	-	-	-	-	-	-	-	-	-	-
New Mexico....	4	-	-	1	100	1	100	-	-	-	-	-	-	2	100	-	-	2	100	-	-	-	-	1	100	-	-	1	100	-	-
North Dakota..	2	1	100	-	-	-	-	-	-	-	-	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ohio..........	81	32	74	11	26	10	91	1	9	-	-	12	34	23	66	9	39	13	57	1	4	-	-	3	100	1	33	2	67	-	-
Oklahoma......	15	-	-	15	100	7	47	7	47	1	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pennsylvania..	293	149	86	24	14	10	42	8	33	6	25	14	22	51	78	7	14	36	71	8	15	19	35	36	65	11	31	21	58	4	11
Tennessee.....	28	6	32	13	68	13	100	-	-	-	-	1	25	3	75	2	67	-	-	1	33	2	40	3	60	2	67	11	33	-	-
Utah..........	15	-	-	2	100	-	-	2	100	-	-	-	-	7	100	-	-	7	100	-	-	-	-	6	100	-	-	6	100	-	-
Virginia......	67	4	10	35	90	32	91	3	9	-	-	1	7	13	93	10	77	2	15	1	8	3	21	11	79	10	91	1	9	-	-
Washington....	10	6	67	3	33	-	-	2	67	1	33	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
West Virginia.	508	203	87	31	13	19	61	10	32	2	7	98	54	82	46	22	27	55	67	5	6	59	63	35	37	18	51	15	43	2	6
Wyoming.......	16	-	-	6	100	1	17	5	83	-	-	-	-	10	100	1	10	9	90	-	-	-	-	-	-	-	-	-	-	-	-
Total....	1,637	516	60	355	40	274	77	66	19	15	4	150	29	363	71	151	42	186	51	26	7	88	35	165	65	96	58	63	38	6	4

TABLE 6. - Dust-allaying practices in bituminous-coal and lignite mines during cutting, according to loading method, by States and employment groups

	Total number of mines	Hand loading										Mechanical loading										Hand and mechanical loading									
		Allaying unnecessary		Allaying necessary								Allaying unnecessary		Allaying necessary								Allaying unnecessary		Allaying necessary							
						Not allayed		Adequately allayed		Allaying inadequate						Not allayed		Adequately allayed		Allaying inadequate						Not allayed		Adequately allayed		Allaying inadequate	
		No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent
Alabama																															
25-99.........	27	17	68	8	32	6	75	1	13	1	12	-	-	-	-	-	-	-	-	-	-	1	50	1	50	-	-	1	100	-	-
100-499.......	36	8	53	7	47	-	-	7	100	-	-	2	20	8	80	1	12	7	88	-	-	2	18	9	82	3	33	6	67	-	-
500-999.......	9	-	-	1	100	-	-	1	100	-	-	-	-	5	100	-	-	5	100	-	-	-	-	3	100	-	-	3	100	-	-
1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total.....	72	25	61	16	39	6	38	9	56	1	6	2	13	13	87	1	8	12	92	-	-	3	19	13	81	3	23	10	77	-	-
Arkansas																															
25-99.........	13	2	15	11	85	5	45	4	36	2	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-499.......	6	1	17	5	83	2	40	3	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
500-999.......	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total.....	19	3	16	16	84	7	43	7	43	2	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colorado																															
25-99.........	20	5	30	11	70	4	37	7	63	-	-	-	-	3	100	-	-	3	100	-	-	-	-	1	100	-	-	1	100	-	-
100-499.......	12	4	80	1	20	1	100	-	-	-	-	-	-	5	100	1	20	4	80	-	-	1	50	1	50	-	-	1	100	-	-
500-999.......	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	100	-	-	1	100	-	-
1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total.....	33	9	43	12	57	5	42	7	58	-	-	-	-	8	100	1	12	7	88	-	-	1	25	3	75	-	-	3	100	-	-
Illinois																															
25-99.........	58	19	45	23	55	19	82	2	9	2	9	2	14	12	86	9	75	2	17	1	8	-	-	2	100	2	100	-	-	-	-
100-499.......	49	3	33	6	67	5	88	1	12	-	-	2	5	38	95	16	42	18	47	4	11	-	-	-	-	-	-	-	-	-	-
500-999.......	12	-	-	-	-	-	-	-	-	-	-	-	-	12	100	-	-	9	75	3	25	-	-	-	-	-	-	-	-	-	-
1,000 and more	1	-	-	-	-	-	-	-	-	-	-	-	-	1	100	-	-	-	-	1	100	-	-	-	-	-	-	-	-	-	-
Total.....	120	22	43	29	57	24	83	3	10	2	7	4	6	63	94	25	40	29	46	9	14	-	-	2	100	2	100	-	-	-	-

TABLE 6. - Dust-allaying practices in bituminous-coal and lignite mines during cutting, according to loading method, by States and employment groups (Cont'd.)

	Total number of mines	Hand loading										Mechanical loading										Hand and mechanical loading									
		Allaying unnecessary		Allaying necessary								Allaying unnecessary		Allaying necessary								Allaying unnecessary		Allaying necessary							
						Not allayed		Adequately allayed		Allaying inadequate						Not allayed		Adequately allayed		Allaying inadequate						Not allayed		Adequately allayed		Allaying inadequate	
		No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent
Indiana																															
25-99.........	10	3	38	5	62	5	100	-	-	-	-	-	-	1	100	1	100	-	-	-	-	-	-	1	100	1	100	-	-	-	-
100-499.......	17	-	-	-	-	-	-	-	-	-	-	3	18	14	82	10	71	3	21	1	8	-	-	-	-	-	-	-	-	-	-
500-999.......	1	-	-	-	-	-	-	-	-	-	-	-	-	1	100	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total.....	28	3	38	5	62	5	100	-	-	-	-	3	16	16	84	12	75	3	19	1	6	-	-	1	100	1	100	-	-	-	-
Iowa																															
25-99.........	9	8	89	1	11	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-499.......	1	-	-	-	-	-	-	-	-	-	-	-	-	1	100	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-
500-999.......	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total.....	10	8	89	1	11	1	100	-	-	-	-	-	-	1	100	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kansas																															
25-99.........	2	-	-	2	100	2	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-499.......	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
500-999.......	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total.....	2	-	-	2	100	2	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kentucky																															
25-99.........	157	24	22	83	78	83	100	-	-	-	-	6	16	31	84	29	93	2	7	-	-	-	-	13	100	13	100	-	-	-	-
100-499.......	123	2	4	48	96	46	96	2	4	-	-	4	10	38	90	31	82	7	18	-	-	-	-	31	100	31	100	-	-	-	-
500-999.......	8	-	80	2	20	2	100	-	-	-	-	-	-	1	100	-	-	1	100	-	-	-	-	5	100	3	60	2	40	-	-
1,000 and more	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	100	1	50	1	50	-	-
Total.....	290	26	16	133	84	131	99	2	1	-	-	10	12	70	88	60	86	10	14	-	-	-	-	51	100	48	94	3	6	-	-

TABLE 6. - **Dust-allaying practices in bituminous-coal and lignite mines during cutting, according to loading method, by States and employment groups (Cont'd.)**

	Total number of mines	Hand loading										Mechanical loading										Hand and mechanical loading									
		Allaying unnecessary		Allaying necessary								Allaying unnecessary		Allaying necessary								Allaying unnecessary		Allaying necessary							
						Not allayed		Adequately allayed		Allaying inadequate						Not allayed		Adequately allayed		Allaying inadequate						Not allayed		Adequately allayed		Allaying inadequate	
		No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent
Maryland																															
25-99.........	8	8	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-499.......	3	2	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	100	-	-	-	-	-	-	-	-
500-999.......	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total.....	11	10	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	100	-	-	-	-	-	-	-	-
Michigan																															
25-99.........	1	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-499.......	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
500-999.......	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total.....	1	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Missouri																															
25-99.........	8	8	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-499.......	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
500-999.......	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total.....	8	8	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Montana																															
25-99.........	1	-	-	-	-	-	-	-	-	-	-	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-499.......	3	-	-	-	-	-	-	-	-	-	-	2	67	1	33	-	-	1	100	-	-	-	-	-	-	-	-	-	-	-	-
500-999.......	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total.....	4	-	-	-	-	-	-	-	-	-	-	3	75	1	25	-	-	1	100	-	-	-	-	-	-	-	-	-	-	-	-

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TABLE 6. - Dust-allaying practices in bituminous-coal and lignite mines during cutting, according to loading method, by States and employment groups (Cont'd.)

	Total number of mines	Hand loading										Mechanical loading										Hand and mechanical loading									
		Allaying unnecessary		Allaying necessary								Allaying unnecessary		Allaying necessary								Allaying unnecessary		Allaying necessary							
						Not allayed		Adequately allayed		Allaying inadequate						Not allayed		Adequately allayed		Allaying inadequate						Not allayed		Adequately allayed		Allaying inadequate	
		No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent
New Mexico																															
25-99.........	1	-	-	1	100	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-499.......	3	-	-	-	-	-	-	-	-	-	-	-	-	2	100	-	-	2	100	-	-	-	-	1	100	-	-	1	100	-	-
500-999.......	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total.....	4	-	-	1	100	1	100	-	-	-	-	-	-	2	100	-	-	2	100	-	-	-	-	1	100	-	-	1	100	-	-
North Dakota																															
25-99.........	1	1	100	-	-	-	-	-	-	-	-	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-499.......	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
500-999.......	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total.....	2	1	100	-	-	-	-	-	-	-	-	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ohio																															
25-99.........	49	31	80	8	20	8	100	-	-	-	-	5	56	4	44	4	100	-	-	-	-	-	-	1	100	1	100	-	-	-	-
100-499.......	24	1	25	3	75	2	67	1	33	-	-	7	39	11	61	5	45	5	45	1	10	-	-	2	100	-	-	2	100	-	-
500-999.......	8	-	-	-	-	-	-	-	-	-	-	-	-	8	100	-	-	8	100	-	-	-	-	-	-	-	-	-	-	-	-
1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total.....	81	32	74	11	26	10	91	1	9	-	-	12	34	23	66	9	39	13	57	1	4	-	-	3	100	1	33	2	67	-	-
Oklahoma																															
25-99.........	12	-	-	12	100	6	50	5	42	1	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-499.......	3	-	-	3	100	1	33	2	67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
500-999.......	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total.....	15	-	-	15	100	7	47	7	47	1	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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TABLE 6. - **Dust-allaying practices in bituminous-coal and lignite mines during cutting, according to loading method, by States and employment groups (Cont'd.)**

	Total number of mines	Hand loading										Mechanical loading										Hand and mechanical loading									
		Allaying unnecessary		Allaying necessary								Allaying unnecessary		Allaying necessary								Allaying unnecessary		Allaying necessary							
						Not allayed		Adequately allayed		Allaying inadequate						Not allayed		Adequately allayed		Allaying inadequate						Not allayed		Adequately allayed		Allaying inadequate	
		No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent
Pennsylvania																															
25-99.........	166	126	94	8	6	5	63	2	25	1	12	9	60	6	40	4	66	1	17	1	17	13	76	4	24	1	25	-	-	3	75
100-499.......	89	22	67	11	33	5	46	3	27	3	27	5	15	29	85	3	10	20	69	6	21	6	27	16	73	5	31	10	62	1	7
500-999.......	31	1	17	5	83	-	-	3	60	2	40	-	-	12	100	-	-	12	100	-	-	-	-	13	100	5	38	8	62	-	-
1,000 and more	7	-	-	-	-	-	-	-	-	-	-	-	-	4	100	-	-	3	100	1	-	-	-	3	100	-	-	3	100	-	-
Total.....	293	149	86	24	14	10	42	8	33	6	25	14	22	51	78	7	14	36	71	8	15	19	35	36	65	11	31	21	58	4	11
Tennessee																															
25-99.........	7	4	80	1	20	1	100	-	-	-	-	1	100	-	-	-	-	-	-	-	-	1	100	-	-	-	-	-	-	-	-
100-499.......	21	2	14	12	86	12	100	-	-	-	-	-	-	3	100	2	67	-	-	1	33	1	25	3	75	2	67	1	33	-	-
500-999.......	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total.....	28	6	32	13	68	13	100	-	-	-	-	1	25	3	75	2	67	-	-	1	33	2	40	3	60	2	67	1	33	-	-
Utah																															
25-99.........	3	-	-	2	100	-	-	2	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	100	-	-	1	100	-	-
100-499.......	10	-	-	-	-	-	-	-	-	-	-	-	-	5	100	-	-	5	100	-	-	-	-	5	100	-	-	5	100	-	-
500-999.......	2	-	-	-	-	-	-	-	-	-	-	-	-	2	100	-	-	2	100	-	-	-	-	-	-	-	-	-	-	-	-
1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total.....	15	-	-	2	100	-	-	2	100	-	-	-	-	7	100	-	-	7	100	-	-	-	-	6	100	-	-	6	100	-	-
Virginia																															
25-99.........	20	1	7	13	93	13	100	-	-	-	-	1	50	1	50	1	100	-	-	-	-	1	25	3	75	3	100	-	-	-	-
100-499.......	40	3	14	19	86	17	90	2	10	-	-	-	-	11	100	9	82	2	18	-	-	2	29	5	71	5	100	-	-	-	-
500-999.......	6	-	-	3	100	2	67	1	33	-	-	-	-	1	100	-	-	-	-	1	100	-	-	2	100	1	50	1	50	-	-
1,000 and more	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	100	1	100	-	-	-	-
Total.....	67	4	10	35	90	32	91	3	9	-	-	1	7	13	93	10	77	2	15	1	8	3	21	11	79	10	91	1	9	-	-

TABLE 6. - Dust-allaying practices in bituminous-coal and lignite mines during cutting, according to loading method, by States and employment groups (Cont'd.)

	Total number of mines	Hand loading										Mechanical loading										Hand and mechanical loading									
		Allaying unnecessary		Allaying necessary								Allaying unnecessary		Allaying necessary								Allaying unnecessary		Allaying necessary							
						Not allayed		Adequately allayed		Allaying inadequate						Not allayed		Adequately allayed		Allaying inadequate						Not allayed		Adequately allayed		Allaying inadequate	
		No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent	No. of mines	Per-cent
Washington																															
25-99.........	6	5	100	-	-	-	-	-	-	-	-	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100-499.......	4	1	25	3	75	-	-	2	67	1	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
500-999.......	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	10	6	67	3	33	-	-	2	67	1	33	1	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
West Virginia																															
25-99.........	229	128	90	15	10	10	67	4	26	1	7	46	72	18	28	8	44	9	50	1	6	15	68	7	32	6	86	-	-	1	14
100-499.......	237	71	83	15	17	8	53	6	40	1	7	49	51	47	49	14	30	29	62	4	8	38	69	17	31	6	35	11	65	-	-
500-999.......	36	2	67	1	33	1	100	-	-	-	-	3	16	16	84	-	-	16	100	-	-	4	40	10	60	5	50	4	40	1	10
1,000 and more	6	2	100	-	-	-	-	-	-	-	-	-	-	1	100	-	-	1	100	-	-	2	67	1	33	1	100	-	-	-	-
Total.....	508	203	87	31	13	19	61	10	32	2	7	98	54	82	46	22	27	55	67	5	6	59	63	35	37	18	51	15	43	2	6
Wyoming																															
25-99.........	9	-	-	4	100	1	25	3	75	-	-	-	-	5	100	1	20	4	80	-	-	-	-	-	-	-	-	-	-	-	-
100-499.......	7	-	-	2	100	-	-	2	100	-	-	-	-	5	100	-	-	5	100	-	-	-	-	-	-	-	-	-	-	-	-
500-999.......	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,000 and more	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total.....	16	-	-	6	100	1	17	5	83	-	-	-	-	10	100	1	10	9	90	-	-	-	-	-	-	-	-	-	-	-	-
Total																															
25-99.........	817	390	65	208	35	170	81	30	15	8	4	73	47	81	53	57	70	21	26	3	4	31	65	34	52	27	80	3	9	4	11
100-499.......	689	121	47	135	53	99	73	31	23	5	4	74	25	218	75	93	43	108	49	17	8	51	36	90	64	52	58	37	41	1	1
500-999.......	114	3	20	12	80	5	42	5	42	2	16	3	5	58	95	1	2	53	91	4	7	4	11	34	89	14	41	19	56	1	3
1,000 and more	17	2	100	-	-	-	-	-	-	-	-	-	-	6	100	-	-	4	67	2	33	2	22	7	78	3	43	4	57	-	-
Total.....	1,637	516	60	355	40	274	77	66	19	15	4	150	29	363	71	151	42	186	51	26	7	88	35	165	65	96	58	63	38	6	4